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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,417	10/15/2003	Samir M. Hanash	UM-08410	7294

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EXAMINER	
YANG, NELSON C	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 09/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/686,417	HANASH ET AL.	
	Examiner	Art Unit	
	Nelson Yang	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/22/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-15 in the reply filed on June 22, 2006 is acknowledged.

2. Applicant's election without traverse of the species of ESI-oa-TOF mass spectrometry in the reply filed on June 22, 2006 is acknowledged.

3. Claims 16-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on June 22, 2006.

4. Applicant's cancellation of claims 16-33 is acknowledged and has been entered.

5. Claims 1-15 are currently under examination.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanash et al. [US 2003/0013138] in view of Schneider et al. [US 6,537,432].

With respect to claim 1, Hanash et al. teach a method for displaying proteins comprising providing a sample comprising a plurality of proteins, a first separation apparatus and a second separation device (para. 0033), wherein the proteins are separated

by a first step based on protein charge and by a second step based on protein hydrophobicity (para. 0031). Hanash et al. further teach further immobilizing the separated proteins onto arrays and determining the nature of the bound material by mass spectrometry (para. 0051). Hanash et al., however, do not specifically disclose separating the products on the basis of size.

Schneider et al., however, teach the separation of a plurality of proteins (claim 1), using the method of capillary isoelectric focusing electrophoresis, capillary zone electrophoresis, and capillary gel electrophoresis (claim 5), wherein capillary isoelectric focusing electrophoresis separates proteins on the basis of their isoelectric points (charge) (column 10, lines 22-45), capillary zone electrophoresis separates proteins on the basis of their charge to mass ratio (column 15, lines 60-65), and capillary gel electrophoresis separates proteins solely on the basis of size (column 17, lines 5-20). Schneider et al. teach that this allows for the ability to resolve proteins in even complex mixtures such as those obtained from tissues and native cells (column 3, lines 10-20) by separating proteins on the basis of different characteristics (column 3, lines 40-45). Schneider et al. further teach that additional information can be obtained by individual analysis with mass spectrometry (column 5, lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further separate the proteins based on size as taught by Schneider et al. in the method of Hanash et al., because Schneider et al. teach that this allows for the ability to better resolve proteins in even more complex mixtures such as those obtained from tissues and native cells by separating proteins on the basis of

additional different characteristics (including size), which would allow for better separation of proteins when there is a complex mixture of various materials.

8. With respect to claim 2, Hanash et al. teach a separation device involving capillary isoelectric focusing electrophoresis, (para. 0023).

9. With respect to claim 3, Hanash et al. teach a separation device involving reverse phase chromatography (para. 0024).

10. With respect to claim 4, Schneider et al. teach that the separation by size is performed by a separation device involving capillary gel electrophoresis (claim 5).

11. With respect to claims 5-7, Hanash et al. teach further analyzing the products by mass spectrometry to determine the mass and/or identity of the product (para. 0104), such as matrix-assisted laser desorption ionization time-of-flight mass spectrometry or electrospray mass spectrometry (para. 0075).

12. With respect to claims 8-9, Hanash et al. teach a method comprising separating proteins based on one or more physical property to produce a plurality of protein fractions, and then attaching the protein fractions onto pre-selected locations on the solid support (para. 0011).

13. With respect to claims 10 and 11, Hanash et al. further teach performing an antibody assay on the fractions (fig. 12, para. 0025).

14. With respect to claim 12, Hanash et al. teach that the proteins may comprise a portion of the E.Coli. proteome (para. 0072).

15. With respect to claim 13, Hanash et al. teach comparing proteins (a plurality of polypeptides) from different cell samples (para. 0008).

16. With respect to claims 14, Hanash et al. teach the comparison of protein profiles from cancerous and non-cancerous samples (para. 0032), which would involve separation of the proteins based their different physical properties (para. 0031), which as discussed above, based on the combination of Hanash et al. and Schneider et al., would involve separations based on charge, hydrophobicity, and size.

17. With respect to claim 14, Hanash et al. teach the comparison of protein profiles from cancerous and non-cancerous samples (para. 0032).

18. With respect to claim 15, Hanash et al. teach the comparison of protein profiles from cancerous and non-cancerous samples (para. 0032), and further teach that the overall pattern obtained for separated proteins from one sample source can be compared with the pattern from another sample source (para. 0075). As discussed above, based on the combination of Hanash et al. and Schneider et al., the comparison would be based on separated proteins that are separated based on charge, hydrophobicity, and size.

19. Claims 1-7, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubman et al. [US 2002/0098595] in view of Schneider et al. [US 6,537,432].

With respect to claim 1, Lubman et al. teach a method for displaying proteins comprising providing a sample comprising a plurality of proteins, a first separation apparatus and a second separation device (para. 0055), wherein the proteins are separated by a first step based on protein charge and by a second step based on protein hydrophobicity (para. 0065). Lubman et al further teach further analyzing the products by mass spectrometry to determine the mass and/or identity of the product to obtain a three

dimensional profile of the proteins (para. 00104). Lubman et al., however, do not specifically disclose separating the products on the basis of size.

Schneider et al., however, teach the separation of a plurality of proteins (claim 1), using the method of capillary isoelectric focusing electrophoresis, capillary zone electrophoresis, and capillary gel electrophoresis (claim 5), wherein capillary isoelectric focusing electrophoresis separates proteins on the basis of their isoelectric points (charge) (column 10, lines 22-45), capillary zone electrophoresis separates proteins on the basis of their charge to mass ratio (column 15, lines 60-65), and capillary gel electrophoresis separates proteins solely on the basis of size (column 17, lines 5-20). Schneider et al. teach that this allows for the ability to resolve proteins in even complex mixtures such as those obtained from tissues and native cells (column 3, lines 10-20) by separating proteins on the basis of different characteristics (column 3, lines 40-45). Schneider et al. further teach that additional information can be obtained by individual analysis with mass spectrometry (column 5, lines 55-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further separate the proteins based on size in the method of Lubman et al., because Schneider et al. teaches that this allows for the ability to better resolve proteins in even more complex mixtures such as those obtained from tissues and native cells by separating proteins on the basis of additional different characteristics (including size).

20. With respect to claim 2, Lubman et al. teach a separation device involving capillary isoelectric focusing electrophoresis, (para. 0053).

21. With respect to claim 3, Lubman et al. teach a separation device involving reverse phase HPLC (para. 0032).

22. With respect to claim 4, Schneider et al. teach a separation device involving capillary gel electrophoresis (claim 5).

23. With respect to claims 5-7, Lubman et al. teach further analyzing the products by mass spectrometry to determine the mass and/or identity of the product (para. 0104), wherein the mass spectrometry may be ESI oa TOF/MS (para. 0054).

24. With respect to claim 12, Lubman et al. teach that the system used by the method can be used for rapid proteome analysis (pgn 0151), which would require analysis of proteome samples.

25. With respect to claim 13, Lubman et al. teach providing a first and second sample comprising a plurality of proteins (para. 0020).

26. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lubman et al. [US 2002/0098595] in view of Schneider et al. [US 6,537,432], and further in view of Hanash et al. [US 2003/0013138].

With respect to claims 8, 9, the combination of Lubman et al. and Schneider et al. the invention substantially as claimed (se above with respect to claim 1). In summary, Lubman et al. and Schneider et al. teach a method for displaying proteins comprising providing a sample comprising a plurality of proteins, a first separation apparatus based on charge, a second separation device based on hydrophobicity, and a third separation apparatus based on size. Schneider et al. further teach that teach that by separating proteins on the basis of different characteristics (column 3, lines 40-45) the ability to

resolve proteins in even complex mixtures such as those obtained from tissues and native cells is possible (column 3, lines 10-20). Neither Lubman et al. nor Schneider et al. teach immobilizing the fractions onto a solid support.

Hanash et al., however, teach a method comprising separating proteins based on one or more physical property to produce a plurality of protein fractions, and then attaching the protein fractions onto pre-selected locations on the solid support (para. 0011). Hanash et al. further teach that by doing this, rare proteins that normally would not be present in sufficient quantity to distinguish their presence or behavior can therefore be isolated and arrayed, as candidates for drug screening (para. 0012).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to attach protein fractions onto pre-selected locations on the solid support, as taught by Hanash et al., in the method Lubman et al. and Schneider et al. because Hanash et al. teach that by doing this, rare proteins that normally would not be present in sufficient quantity to distinguish their presence or behavior can therefore be isolated and arrayed, as candidates for drug screening, which would allow for better identification of proteins that are candidate targets for drug development, as rare proteins that normally would not be present in sufficient quantity to distinguish their presence or behavior would be isolated and characterized by this manner.

27. With respect to claims 10, 11, Hanash et al further teach performing an antibody assay on the fractions (fig. 12, para. 0025).

Conclusion

28. No claims are allowed.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson Yang whose telephone number is (571) 272-0826. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long V. Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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